General Course Information

BIOL 402: Experiments in Plant Physiology

The course explores a broad range of concepts in experimental plant physiology. Topics covered may vary somewhat year-to-year, and are subject to change, but generally include lab exercises on photosynthesis/respiration, plant enzyme analysis, growth and development, phytohormones, genomics/bioinformatics, protein electrophoresis/western blotting, and gene expression. In addition, a major independent project is carried out (in pairs) during the final weeks of the course and allows students to participate in discovery-based research where they conduct experiments of their own design. Students present their project to the class in the final lab slot (and the tutorial slot if necessary). Regular pre-lab quizzes and proposed work-plans are used throughout the course to help students come prepared for the labs and to gauge their understanding of course material. The lab test conducted near the end of the course covers all material from the course prior to the independent projects. The nature of graded assignments will vary year-to-year but could include one or more of the following: in-class quizzes, online quizzes/assignments, major independent lab project (in pairs), lab write-ups, participation in discussions in class, class presentation (on your project topic).

Credits: 3.0

Co-requisite: BIOL341/3.0

Lecture/Lab Times and Locations: See Solus

Course Email: biol402@queensu.ca

Important University Dates

Key dates (first day of class, tuition due date, last day to add/drop courses) are important to your academic success. Please find them at Important Dates.

If you enroll in the course late, please email biol402@queensu.ca immediately.

Welcome Message

Welcome to Experiments in Plant Physiology!

BIOL402 is an experiential lab course that will give you the opportunity engage in key plant science experiments and to acquire real-world skills. You'll be introduced to a broad range of techniques in the first part of the term that you will then be able to apply to your Independent Research Project.

Equity, Diversity, and Inclusivity Statement

Queen's University recognizes that the values of equity and diversity are vital to and in harmony with its educational mission and standards of excellence. It acknowledges that direct, indirect, and systemic discrimination exists within our institutional structures, policies and practices and in our community. These take many forms and work to differentially advantage and disadvantage persons across social identities such as race, ethnicity, disability, gender identity, sexual orientation, faith, and socioeconomic status, among other examples.

Land Acknowledgement

Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory. To acknowledge this traditional territory is to recognize its longer history, one predating the establishment of the earliest European colonies. It is also to acknowledge this territory's significance for the Indigenous peoples who lived, and continue to live, upon it – people whose practices and spiritualities were tied to the land and continue to develop in relationship to the territory and its other inhabitants today. The Kingston Indigenous community continues to reflect the area's Anishinaabe and Haudenosaunee roots. There is also a significant Métis community and there are First Peoples from other Nations across Turtle Island present here today.

We encourage you to learn about the history of these lands.

https://www.queensu.ca/encyclopedia/t/traditional-territories

https://www.queensu.ca/indigenous/ways-knowing/land-acknowledgement

Expectations

As your instructors, we will

- do our best to help you both enjoy and succeed in this course
- offer many different opportunities for you to demonstrate your abilities
- give constructive and timely feedback
- provide support and encouragement
- communicate with you respectfully

From you, as students, we expect

- your on-time attendance and attention in the lab sessions
- that you show proper care for lab materials and follow all clean-up instructions
- on-time submission of activities (see "Submitting Assessments Properly and On-Time", below)
- that you will uphold the values of academic integrity (see the "Academic Integrity" section later in this Syllabus)
- respectful communication and interactions with peers and members of the teaching team (see the "Netiquette and Discussion Statement", below)

Submitting Assessments Properly and On-Time

Only assignments received by the due date (or the end of the grace period, if there is one) will be accepted. Late assignments cannot be accepted, and will receive a grade of zero. To avoid this:

- See the Timeline for due dates and times.
- Don't wait until the last minute, as technical delays may prevent your submission from going through.
- Make sure you submit the proper file, in the proper format (PDF).
- Make sure you submit your file to the proper folder.
- For group submissions, note that it is the responsibility of all group members to ensure proper, on-time submission. Be sure to double-check that your designated group member has submitted your assignment properly.

Netiquette and Discussion Statement

University is a place to share, question, and challenge ideas. Each student brings a different set of lived experiences. You can help to create a safe, respectful place for each other by promoting the following guidelines:

1. Make a personal commitment to learn about, understand, and support your peers.
2. Assume the best of others and expect the best of them.
3. Acknowledge the impact of oppression on other people's lives and make sure your communications are respectful and inclusive.
4. Recognize and value the experiences, abilities, and knowledge each person brings.
5. Pay close attention to what your peers say/write before you respond. Think through your response carefully before you say/send it to others.
6. It’s alright to disagree with ideas, but do not make personal attacks.
7. Be open to being challenged or confronted on your ideas, and challenge others with the intent of facilitating growth. Do not demean or embarrass others.
8. Encourage others to develop and share their ideas.

Course Learning Outcomes

The main goal of Biol 402 is to help students acquire a comprehension of experimental plant biology. The course explores various lab exercises in plant cell biology, physiology, anatomy, bioinformatics, and biochemistry.

The course objectives, broadly speaking, are to help students to:

i. understand plant biology through experimental methods

ii. understand the scientific method of hypothesis development and testing

iii. learn a number of new technical skills applicable to a broad range of scientific endeavours

Course Materials

Textbook

There is no course textbook, however you may find it helpful at time to refer to your BIOL341 textbook.

Lab notebook

Although it's possible to take notes directly on your laptop, it's recommended that you keep a hard copy lab notebook instead (not for marks, just for reference). We recommend just going with an inexpensive (e.g. dollar store) soft-cover spiral notebook, or repurposing a partially used notebook.

Lab safety

Some labs will require lab coats (not provided). Closed-toe and closed-heel shoes are required in all labs.

Internet-Connected Device

An internet-connected device is required to access course material.

Suggested Time Commitment

The table below provides an estimate of hours of study. Keep in mind that time commitment will vary among students depending upon individual aptitude, level of background, etc.

Activity	Average Hours/Week	Number of Weeks	Total
Laboratories	5	12	60
Online activities	2	4	8
Private study	4	12	48
Total			116

Timing of Final Examination

There is no final exam for this course; however, there is a Lab Test in Week 11 and the Independent Research Project Final Reports are due during the Final Exam period.

Assessment

Breakdown of Assessment Grades

Component	Weight (%)
Prep Quizzes (Labs 2,3,4,5)	4 x 1% = 4%
Work Plans (Labs 2,3,4,5)	4 x 2% = 8%

Lab Reports (Labs 1,2,3,4,5,6)	6 x 5% = 30%
Lab Test	15%
IRP Proposals (outline/table + final)	8%
IRP Presentation	10%
IRP Final Report	20%
IRP Peer & Self Evaluation	5%

Due dates for all assessments can be found in the Timeline. A penalty of 5% per day will be applied to all late submissions.

Essential Requirements and Flexibility to Succeed

Essential Requirement: To pass this course, you must earn a final grade of at least 50%.

Flexibility to Succeed: We offer large submission windows (multiple days, multiple weeks) and onQ quizzes are untimed. If a student encounters difficulties completing course material, they are encouraged to speak with one of the course instructors.

Grading Scheme and Regrade Requests

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52

Questions about the Course and Contacting the Teaching Team

You should be able to find the answers to most of your questions about the course in general in this **Syllabus** or in the **Timeline**. However, if you're unable to find the answer you're looking for though those means, please talk to one of the instructors during lab time, or email biol402@queensu.ca.

Please use only your Queen's email account for any email communication. Any communications sent out by us will be to this account only, so please check it regularly.

Course Announcements

Any changes to the course or any other form of announcements are made via the Announcements tool on the course homepage. We strongly encourage you to sign up to automatically receive a notice that a new announcement has been posted: instructions to Set up Your Email/SMS Notifications .

Course Feedback

At various points during the course, we may ask you to take part in a variety of feedback activities, such as surveys, questionnaires, and exit tickets.

This feedback enables us to make any adjustments necessary to improve your learning environment. Additional feedback will be sought throughout the course. All surveys are anonymous, and directly related to activities, assessments, and other course material.

Accommodations for Disabilities

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all their academic activities.

If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the **Queen's Student Accessibility Services (QSAS)** and register as early as possible; see also the "QSAS Accommodations (Ventus)" button on the course homepage. For more information, including important deadlines, please visit the QSAS website.

We are unable to automatically apply individual time accommodations to group submissions. Please speak with a course instructor prior to the due date of a group activity if you require additional time for reasons related to your disability.

Please also speak with a course instructor if you wish to apply your accommodations to the Lab Test, or require any classroom accommodations.

Academic Consideration for Students in Extenuating Circumstances

Academic consideration is a process for the university community to provide a compassionate response to assist students experiencing unforeseen, short-term extenuating circumstances that may impact or impede a student's ability to complete their academics. This may include but is not limited to:

- Short-term physical or mental health issues (e.g., stomach flu, short-term anxiety or depression, concussion, surgery, medication, vaccination)
  - For information about COVID, please refer to the Illness Absence Reference Guide.

- Responses to traumatic events (e.g., death or serious illness of a loved one, divorce, sexual assault, social injustice)
- Requirements by law or public health authorities (e.g., court date, unexpected non-travel-related requirements to isolate)
- Significant event (e.g., varsity athletic event, distinguished event, serving in the reserve forces)

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances. For more information, please see the Senate Policy on Academic Consideration for Students in Extenuating Circumstances.

How to Apply for Academic Consideration

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. Arts and Science undergraduate students can find the Faculty of Arts and Science protocol and the portal where a request can be submitted. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

For guidance on submitting requests, please refer to the information available on the Academic Consideration website.

If you need to request academic consideration for this course, you will be required to provide the following name and email address to ensure it reaches our team accordingly:

- Instructor/Course Coordinator Name: Wayne Snedden
- Instructor/Course Coordinator email address: biol402@queensu.ca

Students are encouraged to submit requests as soon as the need becomes apparent, as any delay in doing so may limit the Consideration options available.

Academic Integrity

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments conform to the principles of academic integrity.

Departures from academic integrity include (but are not limited to):

- plagiarism
- use of unauthorized materials
- facilitation
- forgery and falsification

Unauthorized use of **text generative AI** software (e.g. ChatGPT or other similar software) is not permitted in this course. Submitting work written wholly or partially by generative AI software for grades is considered plagiarism.

Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

If you are unsure whether your work unintentionally violates academic integrity, please review the Student Academic Success Services (SASS) Academic Integrity module, see the Queen's Academic Integrity website, or check in with your course instructor or TA.

Copyright of Course Materials

Unless otherwise stated, the material on the course website is copyrighted and is for the sole use of students registered in BIOL402. The material on the website may be downloaded for a registered student's personal use but shall not be distributed or disseminated to anyone other than students registered in this course. Copying this material for distribution (e.g. uploading material to a commercial third-party website) can lead to a violation of Copyright law. Find out more about copyright here: http://library.queensu.ca/help-services/copyright-fair-dealing.

Technology Requirements, Turnitin and Photo Consent

Web Browsers

onQ performs best when using the most recent version of the web browsers, Chrome or Firefox. Safari and Edge are strongly discouraged as these web browsers are known to cause issues with onQ.

Internet Speed

While a wired Internet connection is encouraged, we recognize that most students rely on a wireless connection. A minimum download speed of 10 Mbps and up to 20 Mbps for multimedia is recommended. Click here for an Internet speed test.

Technical Support

For technology support ranging from setting up your device, issues with onQ to installing software, contact ITS Support Centre.

Turnitin Statement

This course uses Turnitin, a third-party application that helps maintain standards of excellence in academic integrity. Normally, students will be required to submit their course assignments through onQ to Turnitin. In doing so, students' work will be included as source documents in the Turnitin reference database, where they will be used solely to detect plagiarism.

Turnitin is a suite of tools that provide instructors with information about the authenticity of submitted work and facilitates the process of grading. Turnitin compares submitted files against its extensive database of content and produces a similarity report and a similarity score for each assignment. A similarity score is the percentage of a document that is similar to content held within the database. Turnitin does not determine if an instance of plagiarism has occurred. Instead, it gives instructors the information they need to select the authenticity of work as a part of a larger process.

Please read Turnitin's Privacy Pledge, Privacy Policy, and Terms of Service, which govern users' relationship with Turnitin. Also, please note that Turnitin uses cookies and other tracking technologies; however, in its service contract with Queen's, Turnitin has agreed that neither Turnitin nor its third-party partners will use data collected through cookies or other tracking technologies for marketing or advertising purposes. For further information about how you can exercise control over cookies, see Turnitin's Privacy Policy

Turnitin may provide other services that are not connected to the purpose for which Queen's University has engaged Turnitin. Your independent use of Turnitin's other services is subject solely to Turnitin's Terms of Service and Privacy Policy, and Queen's University has no liability for any independent interaction you choose to have with Turnitin.

Photo Consent

From time to time, while in the lab or on the field trip, your instructor or TA may ask for your verbal consent to have your photo taken. Photos of students participating in course-related activities may be used for promotional and outreach purposes, and may be posted on course or department websites or in course or outreach materials. Students are not required to consent to having their photograph taken: if you do not wish to be included in a photograph, simply tell the instructor or TA and move out of frame.

For more information, please see:

https://www.queensu.ca/accessandprivacy/guidance/taking-and-using-images-consent